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INTESTINAL OBSTRUCTION IN THE NEWBORN*

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Developmental defect is the most common cause of intestinal obstruction in infants. This report is presented to illustrate the types and incidence of alimentary tract obstructions in babies under one year of age, with the surgical measures used in correcting them. The 17 infants operated upon represent unselected consecutive cases which occurred in my general surgery practice during a period of one year. Significant statistical information cannot be obtained from such a small series. The purpose is to present a representative group of obstructions and list the surgical measures found useful in their management.

Choice of anesthesia has an important bearing on the surgical mortality rate in infants, perhaps more so than in adults. General anesthesia is not well tolerated by the starved and debilitated infant with intestinal obstruction. The successful performance of abdominal or other operations on the newborn does not require general anesthesia and it is probably best avoided. Local infiltration with $\frac{1}{4}$ to $\frac{1}{2}$ per cent solution of procaine in normal saline gives a satisfactory anesthesia. With local anesthesia the risk appears to be less because the emaciated sick child is conscious and in better general condition at the completion of the operation. Stock solutions of procaine were found to produce erythematous swelling at the sites of injection. Tissue reaction following injection of solutions freshly prepared from sterile ampule procaine crystals and sterile normal saline were negligible or absent.

The prolonged use of indwelling gastro-intestinal suction tubes in babies should be avoided. Such a tube may produce trouble-

some irritation or ulceration of the naso-pharyngeal membranes and can initiate an ascending Eustachian tube infection and otitis media. However, the aspiration of gas and fluid from the distended upper intestinal tract is desirable. This is best done by a small soft rubber tube inserted through the mouth just prior to operation. Abdominal tension is relieved and the tube removed before the patient is sent to the operating room. Prolonged gastric aspiration has also the disadvantage of disrupting chemical balance by the removal of essential enzymes and electrolytes and increasing dehydration.

Preoperative x-ray examinations in infants with intestinal obstruction are not considered essential in making the diagnosis and are often harmful to the sick infant. Barium x-ray studies are best avoided as the procedure taxes the weakened vitality of the child and often fails to give complete information. A partial obstruction may be inadvertently converted to a complete obstruction by retained inspissated barium in the intestine. A flat or "scout" film of the abdomen adds less to the physical burden of the sick baby and frequently gives helpful indications as to the location and nature of the obstructing lesion.

Maintenance of normal body temperature is an essential measure in treatment of the debilitated newborn before, during and after operation. In the operating room a satisfactory heating device was obtained by placing hot water bottles in a shallow box which had a top containing multiple perforations. The baby was placed on a blanket which covered the perforated box top. Electric heating pads are not considered safe and may cause first and second degree burns when run at "low" heat. A strip of 2-inch adhesive tape placed across the thighs just above the knees and anchored at the sides of the table keep the lower extremities fixed in extension during opera-

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tion. The undershirt is not removed in the operating room as it affords a protective covering for the arms and shoulders. A thin blanket is placed snugly across the lower extremities. A nurse is seated at the head of the table to watch the pulse, color, and respirations. She holds the baby's hands at the sides of its head and offers a wick of gauze moistened with sugar solution for the baby to suck on during operation.

Successful surgical treatment of intestinal obstruction often requires the use of parenteral fluids for control of dehydration. There are inherent dangers, however, in the over-enthusiastic use of such measures. The emaciation and starvation state resulting from obstruction cannot be successfully combatted by artificial measures alone and is best relieved by immediate surgical correction of the obstruction to permit early oral feeding of the infant. Blood transfusion is helpful in correcting anemia but is not a routine procedure because of the exhausting effect of manipulation often required in giving the blood and the untoward reaction produced at times by transfusion. No fixed routine is employed for the injection of fluids. It is best to treat each patient as an individual problem.

The technic of operation presupposes delicacy in the handling of tissues and organs. To this end the use of several ophthalmologic instruments has been found appropriate for infant abdominal operations. Eyelid retractors and vein retractors make satisfactory abdominal retractors. Conjunctival fixation forceps with the catch removed are useful as tissue forceps. Eye tenotomy and enucleation scissors are helpful in dissection. Round-point eye needles serve well for suturing. Small needle holders and mosquito hemostats are employed. The Babcock viscera forcep is non-crushing and can be used to hold the stomach with minimum trauma.

Fine sutures and ligatures of annealed stainless steel are used exclusively. No. 35 and No. 36 B and S gauge are satisfactory for general abdominal work in infants. The use of catgut, cotton, silk, nylon, or other organic materials is avoided because these substances produce variable degrees of local irritation and undesirable tissue reactions.

The dry surgical wound is less likely to be-

come infected. Impervious wound dressings are not satisfactory because perspiration, urine or other contaminating substances tend to collect or seep under the dressing and are held in contact with the wound where prolonged moisture tends to produce inflammation. Adhesive tape causes skin irritation in most infants and was not employed. The dressing of choice consists of skin closure with interrupted sutures of fine steel, the long ends of which are used to tie over a rolled piece of sterile gauze. This gives a protective covering for the incision with free ventilation and without the use of irritating adhesive materials. If the dressing became wetted by the baby's urine it was allowed to dry undisturbed. All of the patients here reported had this tied-on gauze dressing and none of the wounds became infected. The dressing and skin sutures were removed on the 7th or 8th post-operative day and no other dressing was employed thereafter in most cases.

Early postoperative feeding by mouth was an important aid in correcting systemic chemical imbalance and overcoming the starvation status of these infants. Close cooperation between surgeon and pediatrician make for best results during the immediate postoperative feeding period. The first feeding was usually given 2 to 6 hours after operation. In the absence of peritonitis small amounts of water, then diluted milk can be started with gradually increasing amounts offered at 2-hour intervals. Postoperative vomiting was infrequent or absent after surgical correction of the obstruction. Human milk is the most satisfactory food for the newborn and should be used whenever possible. If the child is doing well by the 2nd or 3rd postoperative day, the mother is permitted to hold and feed her baby.

INCARCERATED INGUINAL HERNIA

About 90 per cent of inguinal hernias occur in males and 60 per cent are on the right side.¹ It was the most frequent cause of intestinal obstruction in this series (Table I).

Reduction of the hernia should always be attempted. A mild sedative, head-low position, the local application of cold compresses, and gentle taxis are frequently successful. Forceful attempts to reduce the hernia or prolonged conservative treatments are dangerous.

TABLE I.

Sex	Age	Duration of Symptoms	Diagnosis	Operation	Post-op Hosp. Days	Result
Boy	11 days	3 hrs.	Incarcerated sm. int., rt. ing. Hernia.	Reduction of int. & repair of hernia	7	Recovery
Boy	2 mo.	6 hrs.	Incarcerated sm. int., rt. ing. Hernia.	Reduction of int. & repair of hernia.	7	Recovery
Boy	2 mo.	24 hrs.	Incarcerated sm. int., undescended rt. testis, umbilical hernia.	Reduction of int., rt. orchidopexy repair of ing. and umbil. hernias.	4	Recovery
Girl	43 days	3 days	Incarcerated rt. tube & ovary in rt. ing. hernia. Prematurity.	Reduction of tube & ovary, repair of hernia.	9	Recovery
Boy	2 mo.	12 hrs.	Incarcerated sm. int., rt. ing. hernia.	Reduction of int. & repair of hernia.	5	Recovery
Boy	1 mo.	6 hrs.	Incarcerated sm. int., rt. ing. hernia.	Reduction of int. & repair of hernia.	9	Recovery
Boy	9 wks.	36 hrs.	Incarcerated sm. int., rt. ing. hernia.	Reduction of int. & repair of hernia.	9	Recovery
Girl	3 mo.	48 hrs.	Incarcerated rt. tube & ovary in rt. ing. hernia, prematurity (birth wt. 2 lb., 4 oz.)	Reduction of tube & ovary, repair of hernia.	36	Recovery
Boy	5 mo.	12 hrs.	Incarcerated cecum & appendix, rt. ing. hernia.	Appendectomy, reduction of cecum, repair of hernia.	7	Recovery
Boy	2 mo.	1 wk.	Hypertrophic pyloric stenosis	Modified Rammstedt	11	Recovery
Girl	1 mo.	2 wks.	Hypertrophic pyloric stenosis	Modified Rammstedt.	12	Recovery
Boy	5 days	5 days	Mid-gut volvulus	Release of volvulus.	21	Recovery
Boy	6 days	6 days	Mid-gut volvulus	Release of volvulus.	17	Recovery
Boy	4 days	4 days	Anomaly of round ligament, incarceration of intestine	Division of round lig., release of intestine.	16	Recovery
Boy	4 days	4 days	Anomaly of round ligament, incarceration of intestine	Division of round lig., release of intestine	10	Recovery
Girl	11 days	11 days	Atresia, esophagus & duodenum; tracheo-esophageal fistula.	Gastro-enterostomy, insertion jejunal feeding tube	2	Died
Girl	2 hrs.	2 hrs.	Omphalocele; prematurity (birth wt. 4 lbs. 3 oz.)	Reduction of viscera and closure of abdomen.	75	Recovery

If a fair trial of conservative measures fails, operation should be done without further delay to prevent possible strangulation of the intestine and subsequent peritonitis. Mortality is high following resection of gangrenous intestine in infants. No cases of gangrene were encountered nor was resection required in the series reported here. In two baby girls the sac was found to contain incarcerated Fallopian tube and ovary showing edematous swelling and irritation. The symptoms of obstruction in these instances were vomiting and distention from adynamic ileus rather than mechanical obstruction.

After repair of the hernia the baby is permitted full freedom of movement. The use of restraints is not recommended as they may cause the child to struggle and thereby increase the strain on the wound.

HYPERTROPHIC PYLORIC STENOSIS

About 30 per cent of obstructions due to hypertrophic pyloric stenosis fail to respond to medical treatment.⁵ A fine sense of judgment may be required in determining when to abandon conservative measures in favor of surgical operation. Progressive starvation on an unsuccessful medical regimen increases the operative risk. Dehydration can be more easily controlled than hypoproteinemia, alkylolosis, and the starvation factor. Nutritional edema is uncommon even in seriously debilitated babies.⁶ Two infants with pyloric obstruction in this series were treated by a modified Ramstedt operation. Feedings were started in 2 to 4 hours after operation and both recovered (Table I).

VOLVULUS

Midgut volvulus presents a confusing picture of intestinal obstruction which may tempt the pediatrician to spend valuable days of scientific study and observation in an effort to determine the exact cause and location of the lesion. Such delay is dangerous. The baby rapidly worsens with inability to retain food and the frequent vomiting of bile, succus entericus, and gastric juices. It is safer to rely on clinical signs and symptoms to make a diagnosis of obstruction and to proceed with the operation not later than the 3rd or 4th day than to attempt unwise and exhausting x-ray studies.

The etiology of midgut volvulus is said to be a congenital anomaly characterized by incomplete rotation of the intestine with attachment of the mesentery to a small area at the origin of the mesenteric artery.² This permits abnormal twisting of the small intestine in a clock-wise direction. Exact preoperative diagnosis can seldom be made with certainty by whatever methods are used. The important thing is to recognize the presence of obstruction and relieve it promptly by operation.

Treatment consists of exteriorizing the distended small intestine through an abdominal incision and untwisting the volvulus. Reduction of the volvulus within the abdomen is usually not satisfactory. It is safer to exteriorize the affected viscera and make certain that the twisting has been relieved. Two cases of midgut volvulus in this series (Table I) were relieved by operation and recovered.

OBSTRUCTION RESULTING FROM ANOMALY OF THE ROUND LIGAMENT OF THE LIVER

A search of recent literature failed to disclose any reported cases of intestinal obstruction resulting from anomaly of the round ligament of the liver. Two such cases were encountered in this series (Table I). Ladd, who has had wide experience in the surgery of infants, states that he has not seen a case of intestinal obstruction from this cause.⁷

In the first instance of round ligament anomaly the obliterating umbilical vessels were found separated from their normal attachment to the anterior abdominal wall. The round ligament had been displaced posteriorly but remained attached at its lower end to the umbilicus and at the upper end to the liver. Several loops of small intestine and a segment of colon had slipped between the anterior abdominal wall and the detached round ligament and were incarcerated and constricted by the ligament but were not gangrenous.

In the second case the round ligament was displaced posteriorly from the anterior abdominal wall but had carried with it a fold of peritoneum forming a pocket into which small intestine had become incarcerated and was constricted from behind by the round ligament. This formed a non-reducible type of internal hernia.

In both cases the constricted intestine was

liberated by dividing the round ligament between clamps and ligating the cut ends. Several months after operation one of these infants had a recurrence of intestinal obstruction which was found at re-operation to be due to adhesions attached to the cut hepatic end of the round ligament. It is felt that excision of the round ligament at the first operation might have prevented the second obstruction. Both babies recovered.

The cause and location of the obstructing lesion was not known in these cases before operation. It is doubtful if the most skillful radiologic examinations would have been of much help but could have been harmful to these babies. In similar cases a careful clinical diagnosis of obstruction which is unrelieved by one day of conservative treatment is sufficient to warrant operation.

CONGENITAL ATRESIA OF THE ALIMENTARY TRACT

Inability to swallow is indicated by choking, coughing, attacks of cyanosis, with the expulsion of the first feeding from the nose and mouth. When esophageal atresia is suspected, barium mixture for x-ray study should not be given as it may spill back into the tracheo-bronchial tree and cause suffocation. A few cubic centimeters of iodized oil introduced through a small soft tube is less dangerous and will show the level of esophageal obstruction.

Vomiting is an early and unremitting symptom of small intestinal atresia. Symptoms appear after the first feeding and the gastric and abdominal distention is progressive.¹ The duodenum is a common site of atresia and is to be differentiated from hypertrophic pyloric stenosis which occurs after the age of three weeks. The absence of bile in the vomitus indicates that the lesion is above the level of the ampulla of Vater. The diagnosis of atresia can be confirmed by Farber's Test² which consists of examining the meconium microscopically for squamous cells. If no squamous cells are found it indicated that vernix cells swallowed in utero were prevented by complete obstruction from reaching the colon.

Palliative operations such as jejunostomy for the relief of duodenal atresia are to be avoided.⁴ Every attempt should be made to restore the continuity of the intestinal tract at

the first operation during the first three or four days after birth. Delay in doing the operation after the diagnosis is made increases the morbidity and mortality.³ Early exteriorization and opening of the blind upper esophageal segment is essential in preventing aspiration pneumonitis and pulmonary atelectasis.

One case of atresia was encountered in this series (Table I). Atresia of the thoracic esophagus associated with tracheo-esophageal fistula and atresia of the duodenum did not come to operation until the 11th day at which time the advanced state of starvation and pulmonary complications presented a formidable problem. Following gastrojejunostomy and the insertion of a jejunostomy feeding tube the infant was successfully fed and passed its first milk-curd stools, but then soon succumbed to pulmonary complications. This case represents the only death in this series and points up the importance of early diagnosis and operation.

OMPHALOCELE

Omphalocele is a congenital umbilical evagination which is said to occur about once in 10,000 births (Babcock). Faulty embryologic development from the 6th week of fetal life results in failure of the abdominal cavity to develop, causing abdominal viscera to protrude into the base of the umbilical cord.

To prevent fatal complications from this condition, replacement of the viscera and closure of the abdominal wall should be done as soon after birth as possible.⁶ Without operation the mortality is 100 per cent from intestinal obstruction or rupture of the thin-walled sac and peritonitis. The abdominal skin stops at the base of the sac and does not cover the exteriorized viscera which are protected only by peritoneum and Wharton's jelly of the umbilical cord. In Boston⁶ twenty cases were treated surgically with a mortality of 50 per cent. When the sac was greater than 8 cm. in diameter, the mortality was 85 per cent.

One case of omphalocele occurred in this series (Table I). The sac which was approximately the size of the baby's head contained the liver, stomach, small and large intestine, spleen, and pancreas. Operation was performed two hours after birth. The viscera

were replaced and the abdominal wall closed with difficulty under tension. The problem was complicated by prematurity, but the baby had an essentially uneventful postoperative course and made a good recovery.

CONCLUSION

Successful treatment of intestinal obstruction in the newborn requires early diagnosis and early operation. The surgeon must not procrastinate once the diagnosis is made. Prolonged conservative treatments which do not relieve the cause of the obstruction, increase morbidity and mortality. Extensive scientific study, especially barium x-ray examinations, may be harmful and are best avoided. Early feeding of the baby by mouth after operation and good nursing care are essential to early recovery. Caution is indicated in the prolonged use of gastro-intestinal suction tubes and over-enthusiastic perenteral injection therapy.

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DISCUSSION

DR. O. A. JAMES (Milford): It has been a real treat to hear the second paper of Dr. Preston's. Because of the infrequency and rarity of the lesions we have all had a tendency to consider a complete obstruction as a thing not to be considered in our differential diagnosis and for that reason we delay and often-times deprive these babies of a chance to survive.

The doctor has very clearly proven that, by making an accurate and early diagnosis and by having good teamwork, many of these babies can be saved and can expect a normal life. The mortality rate that he has in his series is excellent, better than any that I have seen reported elsewhere.

I will not attempt to add anything to this paper, but I would like to say that I found a very good article published recently by Professor Edwin M. Miller at the American School of Medicine, University of Illinois, on obstructions in new born, and in this paper he stated that clinical signs of partial or complete obstruction indicate a strong probability of congenital defects. The diagnosis should be made early. In Dr. Preston's series he had only one congenital defect. Most of them we

consider congenital defects have atresia or stenosis.

Dr. Miller's paper stated that in regard to congenital defects they were most apt to occur in those cases where the embryological development was complex and those places most often were the esophagus at the level of the partition of the trachea, the duodenum, the lower ileum, and also in the large bowel near the anus.

In the one that Dr. Preston told you about with the esophagus atresia he states there may be three possibilities. First, you may have a complete absence of the esophagus. Second, you may have that plus a connection between the trachea and the upper portion. And third, you may have an absence with a connection communication between the lower portion and the trachea. In many of these the prognosis is very poor, but with the improvement and the nice chest surgery we have had in the last few years, several cases have been operated on with success.

Of the obstructions in the intestines the one with the most gloomy prognosis is that of the ileum. The diagnosis is made too late and the patient does not have a chance.

Those of the rectum, and the large bowel, are the most frequent and there again you may have two or three types. It may be just a simple veil, it may be a short segment, or it may be the obliterated end of the large bowel.

I was very much interested in Dr. Preston's remarks in regard to technique. Groselin in his book has stressed the importance of accurate technique in taking care of the baby, and in one edition I have seen they strongly advocate general anesthesia with drip ether. Dr. Preston has had results with local anesthesia.

In regard to the closure, the type of suture that you use, the thing is mainly what the surgeon is accustomed to getting the best results with, and most surgeons advocate a non-organic suture, and preferably a steel suture.

In the series of cases of congenital anomalies reported in the book of Groselin which consisted of atresias they had seven recoveries, seven successful operations within a series of 52 cases, and in both atresia and stenosis in a series of 74 they had 17 recoveries.

The one thing that may account for the small number of congenital anomalies in Dr.

Preston's cases may be the age of the baby, but any persistent vomiting in a new born baby should make us all suspicious of a partial or a complete obstruction. Because of that we should immediately start to work to make an accurate diagnosis and with the help and teamwork of the pediatrician and the surgeon many, many babies will have a chance. If we all keep in mind the importance of this, as Dr. Preston has stressed, I am sure it will be great satisfaction to us that we played a part on the team in saving many lives.

DR. R. O. WARREN (Wilmington): I am pinch-hitting for Dr. O'Donnell who is not able to be here this morning. I am going to make my remarks very brief. I want to emphasize certain things.

Dr. Preston has very adequately covered the surgical part of it. I would like to emphasize this: In the new born vomiting is always a prominent symptom in this particular course of events. The vomiting starts early. It usually starts with the first feeding and it becomes increasingly severe. It becomes so severe that finally even a dram of water by mouth will not be retained. Whether or not it is projectile depends upon the location of the lesion. Even more important than the vomiting, I think, is the degree of distension that you see and that in turn depends upon the location of the lesion. The lower the lesion is, the greater the distension. Peristaltic waves are seen also and that again helps to determine the location of the lesion. The lower the lesion the greater the number of peristaltic waves you see. And these differ from the waves that you see in congenital stenosis in that they may travel several different ways, crosswise, in the abdomen depending upon the loops of the gut. It is very peculiar that one has to practice for fifteen years before one sees a case of this kind. It is more peculiar that you have to learn the hard way. The first case I saw was recognized at post mortem. The second case I saw I recognized, but recognized late. I fooled around and gave the baby barium and it died subsequent to the operation. I am glad to say that the third case I saw personally survived.

Now there is one other condition that you sometimes see in the new born that is very rare. I don't believe I have ever seen a completely full-fledged example of this, but you

may have vomiting in the new born with distension, even death, because of macroconidium ileus.

This brings us to another subject that I am only going to touch upon briefly and that is that there are a certain number of children that have a condition known as congenital chronic cystic fibrosis of the pancreas, with maldevelopment of the intestinal tract as well, and a tendency in the parenteral action to develop respiratory symptoms going on to chronic bronchitis, even bronchiectasis. Very early these babies may have large collections of macroconidium and cause an obstruction.

This subject of chronic cystic fibrosis of the pancreas is also interesting because in a series of five cases reported by Gibbs and Ponches from Chicago and Dr. Sams—I think maybe that was the same series that you were talking about—two of these cases of stenosis that were operated on and end to end anastomosis showed very poor ability to handle food and one of them lived 110 days and died, and the other one had a very, very stormy course in which digestion was only able to be established by large doses of pancreate, which is a drug we also have to use in the chronic cystic fibrosis of the pancreas.

So to sum up then, it depends upon early recognition and I mean *early*, because Dr. Raphael back there will tell you about a baby at the Memorial Hospital that was distended 14 hours after birth, operated on 22 hours after birth and died 36 hours after birth because of this condition in which there was the fibrosis and rupture of the ileum, and finally abscess behind the liver. So the condition can occur very early. It needs to be met with very promptly by the pediatrician observing the case or the general practitioner taking care of small babies. The time of operation is within the first few days, not later than the fourth. You have lost your golden chance after the fourth day.

Dr. Preston was very good in complimenting us upon our care of post-operative cases, but after the surgery is done and the baby is in good condition that follows more or less along by itself and it is not too difficult a job for pediatricians who know anything about it.

DR. JOHN F. HYNES (Wilmington): May I ask Dr. Preston a question as to what the rela-

tive incidence of the condition was in his experience or the experience at the hospital? In other words, if these 17 cases represent all cases during that year on the series, and what the relative incidence of the obstruction in the new born was as compared to all the children seen.

DR. PRESTON: Dr. Hynes, these 17 cases of obstruction represent only the patients on which I operated myself. There were others that occurred during the course of the year at the various hospitals in town where I work, but the incidence I don't know. I couldn't give the exact figures on that. Certainly during the course of a year every general surgeon in town sees a relatively large number of children who require correction of congenital defects, there are cases of cleft-palate and harelips and any number of things for which operations are performed.

I should say, though, that these obstruction cases in my own experience would probably represent, well, say, half of the children in the first year of life who require major operative work. Does that answer the question?

DR. HYNES: Thank you.

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MANAGEMENT OF INFECTIONS SECONDARY TO TUBERCULOSIS

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Lung suppuration following tuberculosis is often regarded as a part of the original picture of the disease rather than as one of its complications. Although it is easy to understand how this attitude became established, it is perhaps best, in this day of antibiotic therapy and chest surgery, to attempt to differentiate the secondary infections (which may harbor few or no tubercle bacilli) from the original acid-

fast foci. In this way therapy may become more specifically directed to both the tubercle bacilli and the secondary invaders, and the period of morbidity from such chronic lung infections may be reduced.

Generally speaking, infections secondary to tuberculosis can be divided into four categories, depending on the anatomical site of the lesion under discussion. These four types are: (1) endobronchial infections, involving the larger bronchi, (2) bronchiectasis, (3) lung abscess, and (4) empyema. It should be clearly understood that this classification is simply one of convenience since, in clinical practice, the patient may have more than one type and the various types may lack any sharp definition between them. For example, it may be extremely difficult to differentiate multiple small lung abscesses following tuberculosis from sacculated bronchiectasis. Similarly, it may be hard to decide just when endobronchial tuberculosis (of the terminal bronchioles and beyond the range of the bronchoscope) is not endobronchial tuberculosis but really bronchiectasis. Nevertheless, if this mixture of different types and the shading of one pathological lesion into another are appreciated at the outset, the discussion can be simplified by considering each type as if it were a separate entity.

ENDOBONCHIAL TUBERCULOSIS

General Considerations. Tuberculous involvement of the bronchi may take place at almost any stage of the disease, and its incidence is roughly proportional to the diligence with which it is sought. If the lungs of "active" cases are carefully sectioned at the autopsy table, pathological lesions are almost invariably found in the terminal bronchioles and in the mucous membrane of the draining bronchi. At autopsy, the larger bronchi and trachea are involved in about one-third of the cases examined.¹ Early in the development of the disease these changes may be non-specific in nature and may be characterized simply by edema and inflammation. At this stage, the lesions in the lung parenchyma may subside and no residuals may later be detected in the draining bronchi. If the disease continues to progress, however, ulceration of the bronchus may take place and granulations may appear. At a

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later stage, progression to various degrees of stenosis may be observed and with it may come a whole host of complications, such as atelectasis, necrosis and abscess formation.

It can be said, then, that endobronchial tuberculosis of some degree can be found post-mortem in practically all patients dying of pulmonary tuberculosis. Its incidence in clinical practice, as determined by physical findings, x-ray examinations and bronchoscopic observation, is somewhat less.

Considerable light has been shed on the pathogenesis of endobronchial tuberculosis by a study of tuberculous lungs obtained by resection, rather than by autopsy.² These resection studies have enabled the pathologist to detect bronchial lesions in all stages of development, in contrast to autopsy studies where only far-advanced, terminal processes are available for examination. In these resected lungs, tuberculosis of the major, lobar or segmental bronchi was found in approximately 50 per cent of the specimens examined. The earliest bronchial lesions seen were submucosal tubercles and round cell infiltrations, indicating spread by way of the lymphatics rather than direct surface implantation. Ulceration occurred when the submucosal tubercles enlarged, broke down and extended through the mucosa.

Bronchial tuberculosis, itself, may be an additional source of trouble by causing further extension of the pulmonary disease and by perpetuating a vicious cycle. Tension cavities in the lung may develop if air is allowed to enter on inspiration but is prevented from leaving the cavity on expiration by a ball-valve type of mechanism within the affected bronchus. Suppuration, abscess formation and bronchiectasis are frequent sequelae if the bronchial stenosis is complete, and these complications may be far more difficult to treat than the original lung disease.

Diagnosis. Aside from direct bronchoscopic inspection, the diagnosis of endobronchial tuberculosis can often be made from the patient's symptoms and his physical and radiological findings. Wilson² tabulates the conditions which should make one suspect endobronchial tuberculosis somewhat as follows:

(1) Clinical

- a. Unilateral wheeze.
- b. Positive sputum or severe respira-

tory symptoms without evident source or with apparently controlled parenchymal disease.

- c. Wide variations in the amounts of sputum (indicating intermittent retention).
- d. Prolonged fever following thoracoplasty.

(2) Roentgenological

- a. Any of the recognized signs of atelectasis or obstructive emphysema.
- b. Basal tuberculosis.
- c. Certain types of cavities.

According to McConkey and Gordon,³ tuberculosis stenosis of the major bronchi can be diagnosed clinically with an accuracy approaching 100 per cent. The cardinal symptom is wheezing. The diagnostic sign is the presence of rhonchi, occasionally audible, more frequently palpable, usually in expiration, and loudest over the stenotic bronchi. In their series of 95 tuberculous patients there were 61 who, during the course of their disease, developed persistent sonorous rhonchi unrelieved by cough. In 58 patients (95 per cent) the diagnosis of bronchial stenosis was confirmed bronchoscopically. In addition to wheezing and rhonchi, an opaque or unexpandable lung in the course of pneumothorax is strongly suggestive of an underlying bronchial stenosis. Pain or soreness in the sternal region, failure of a cavity to close with thoracoplasty, and clinical evidence of tuberculous bronchiectasis are among some of the other suspicious findings that warrant bronchoscopic appraisal. Draining bronchi from tuberculous cavities can often be detected on the routine chest roentgenogram if careful attention is paid to details.

Treatment. An exhaustive discussion of the treatment of pulmonary tuberculosis complicated by tracheobronchial tuberculosis is beyond either the intention or the scope of this article. Suffice it to say that opinion is definitely shifting toward the viewpoint that collapse of the affected lung by pneumothorax is contraindicated since it may convert a partial bronchial stenosis to a complete occlusion. Only in cases of the slightest degree of bronchial involvement can pneumothorax be undertaken without adding appreciably to the patient's disability. If occlusion results from

pneumothorax, then the patient may be left with an unexpanded (and, even worse, unexpandable) atelectatic lobe. Besides, if there is a partial stenosis with a tension cavity distal to it, pneumothorax may actually aggravate the picture by causing further expansion of the cavity and possibly its rupture and empyema. Thoracoplasty is regarded as preferable to pneumothorax. If stenosis is complete, or almost complete, pneumonectomy or partial resection of the lung may be the treatment of choice.

Admittedly, then, there is still some divergence of opinion as to what constitutes ideal management of the parenchymal disease when it is complicated by endobronchial tuberculosis. It is likewise true that medical opinion is still far from unanimous as to how the bronchial lesion itself can be treated. Some men continue to use 30 per cent silver nitrate for cauterizing the visible bronchial ulcerations^{2,4} while others regard such local treatment as either worthless or unnecessary.⁵ It would seem logical that the treatment of ulcerations of the respiratory tract by inhalation of chemotherapeutic and antibiotic aerosols would offer much promise.

Treatment. One of the first of the modern drugs to be given trial in the treatment of endobronchial tuberculosis was *promin* (the sodium salt of p,p'-diaminodiphenylsulfone-n,n'-didextrose sulfonate). Although this compound was quite effective in the therapy of experimental tuberculosis of guinea pigs, it was relatively more toxic for humans and its use has been largely supplanted by streptomycin. Attention was first called to its possible value in tracheobronchial tuberculosis by the report of Zucker, Pinner and Hyman⁶ who administered the drug by massive intravenous drip. It was noted about the same time that nebulized *promin* gave higher blood levels of the drug with less evidence of toxicity.⁷ Subsequently, Edlin and his co-workers⁸ reported their results with *promin* inhalation in various forms of tuberculosis including three cases of tracheobronchial involvement. All three cases did remarkably well on this form of treatment. The doses employed in their series of tests varied from 1.6 to 3.0 grams of *promin* per day divided into four or five daily treatments.

The demonstrated toxicity of *promin*, how-

ever, was soon found to limit sharply its general usefulness in the treatment of tuberculosis. At the same time the discovery of streptomycin, with its greater margin of safety, seemed to provide investigators with the anti-tuberculosis agent for which they had so long been seeking. In June, 1946, after preliminary tests had indicated that streptomycin was effective experimentally and rather non-toxic, the Veterans Administration, the Army and the Navy began a joint investigation into the effects of this antibiotic on human tuberculosis.⁹ In their large and unparalleled series of cases, there were 81 patients who received treatment for tuberculous tracheobronchitis and laryngitis. It is this group that concerns us particularly here.

Diagnosis was made either on the basis of biopsy or on the finding of a positive sputum in the presence of inflammatory or ulcerative lesions visualized by direct bronchoscopy or laryngoscopy. Thirteen patients, collected in one unit from many hospitals, completed therapy prior to January, 1947, and had a period of at least four months of subsequent observation and follow-up. Frank ulcerations had been observed repeatedly in all of these patients prior to treatment. They received a combination of intramuscular (2.4 gm. daily) and aerosol (0.5 gm. daily) therapy. The ulceration healed within ninety days. There was only one relapse in this group in the period of post-treatment observation. Subsequently, an attempt was made to dissociate the effects of aerosol from intramuscular therapy by employing the different routes separately. It was found that aerosol streptomycin, by itself, was rather ineffective and that the intramuscular route was not as effective as combined therapy. Needless to say, the effect on fibrotic lesions of the tracheobronchial tree was negligible.

It is, therefore, the consensus of the joint committee investigating these problems in Army, Navy and Veterans Hospitals that: "There can be no argument as to the effectiveness of streptomycin in healing ulcerative or granulomatous lesions of the tracheobronchial tree or larynx. It should be administered by the intramuscular or the combined intramuscular-aerosol route." The Committee on Therapy of the American Trudeau Society has reached

similar conclusions on the basis of its own investigations.¹⁰ Combined parenteral and topical treatment is suggested at this time, pending more complete information as to the relative merits of these two methods of administration. Streptomycin therapy is advised for treatment of progressive ulcerating lesions of the tracheobronchial tree although it should not be expected to benefit fibrous strictures of the tracheobronchial passages. It may be, as Waksman¹¹ and others¹² have suggested, that the combination of an antibiotic such as streptomycin with a chemotherapeutic sulfone such as promin will prove superior to either one used singly in the treatment of clinical tuberculosis.

BRONCHIECTASIS

General Considerations. Bronchiectasis may occur as a concomitant of tuberculosis, as a sequel to it, or, indeed, it may be confused with it. The clinical similarity between tuberculosis and bronchiectasis is striking. In both there may be gradual wasting, anorexia and weight loss. Almost any clinician who has had a reasonable experience in chest diagnosis can cite instances of patients being sent to sanatoria on a presumptive diagnosis of tuberculosis only to have the patient discharged with a final diagnosis of bronchiectasis. It would not be difficult, surely, to collect a group of cases whose first two or three diagnoses from a tuberculous sanatorium were "bronchiectasis" but who returned for a third or fourth time with tubercle bacilli in their sputum who eventually died of far-advanced tuberculosis.

Because of the close similarity between these two diseases, tuberculosis should be suspected in *every* case of bronchiectasis, at least to the extent of examining the sputum for tubercle bacilli. This is urgent for two reasons. First, the patient who is unknowingly giving off tubercle bacilli in his sputum is a menace to public health. Secondly the presence of absence of tubercle bacilli may alter the plan of therapy, especially if resection of the lung is contemplated. Even if the bronchiectasis seems confined to the lower lobes, it is wise to consider tuberculosis as a possible etiological factor. Although it is a convenient rule of thumb to consider bronchiectasis limited to an

upper lobe as tuberculous, and limited to the lower lobe as non-tuberculous, this rule is far from absolute. Mitchell and Thornton,¹³ for example, have found five cases of tuberculosis associated with bronchiectasis involving a lower lobe, which represents 5 per cent of the cases of bronchiectasis seen in the University of Chicago clinics during a ten-year period. Hinshaw¹⁴ also points out that tuberculosis may occur in any portion of the lung and when it is in a lower lobe it may resemble bronchiectasis.

The frequency with which bronchiectasis appears as a complication or a sequel of tuberculosis is still not fully appreciated. The two factors that are most likely to cause bronchiectasis—infection of the bronchial wall and obstruction of the bronchial lumen with atelectasis distal to it—are rather common accompaniments of tuberculosis at some time during its evolution and development. Ulceration weakens the bronchial wall and allows for dilatation to take place. Atelectasis sets the scene for infection, with its resulting bronchial and pulmonary suppuration.

In tuberculosis, these two processes of ulceration and atelectasis are so intimately related that it is difficult to dissociate the two when one endeavors to determine which shares the greater responsibility. Almost invariably, bronchiectasis can be found distal to the site of a true bronchostenosis. Other mechanisms that can cause bronchial occlusion, atelectasis and subsequent bronchiectasis are: (1) fibrous scars which kink or distort bronchi, and (2) extramural compression of the bronchi from enlarged peribronchial lymph nodes. And, as will be pointed out in greater detail, various collapse measures that are intended to control tuberculosis may actually increase the degree of distortion of the bronchial tree and either cause bronchiectasis or aggravate it if it already exists. Certainly, there are many possible mechanisms by which bronchiectasis can develop during the course of tuberculosis.

Diagnosis. In some instances it may be possible to suspect bronchiectasis upon examination of the routine chest roentgenogram,¹⁵ but errors of both omission and commission are possible unless bronchography is performed. The technic of bronchography varies somewhat in its details from investigator to investigator

but, apparently, satisfactory results can be obtained with any one of a number of different procedures. It is important, however, to acquire familiarity with one method before trustworthy results can be obtained. Positioning of the patient, anesthetization of the pharynx, and instillation of the oil—all these demand a certain attention to detail that is acquired only with experience. The various techniques by which good bronchograms can be obtained are discussed in great detail in the papers of Adams and Davenport,¹⁶ Slater¹⁷ and Poppe¹⁸ and nothing more need be said about it here.

Bronchoscopy may be a further aid to diagnosis both in a negative and a positive way. If a patient has an abundant cough and expectoration, and the routine x-ray and bronchoscopic examinations are negative, bronchiectasis should be suspected and bronchography done. The bronchoscope almost always fails to detect bronchiectasis on direct inspection because the dilated terminal bronchioles are beyond the range of the instrument. In cases of tuberculosis, or subsequent to active tuberculosis, a bronchoscopic examination may reveal narrowing of the bronchial lumen, distortion of the bronchi, or frank stenosis. In any of these instances, one can postulate that there will be bronchiectasis distal to the occlusion. If these conditions are found, it may be of value to leave a catheter in the bronchus after the bronchoscope is withdrawn so that select portions of the lung can be filled with iodized oil. In this way a definite diagnosis of bronchiectasis can be made when all other findings are entirely negative or simply suggestive.

Much of our modern understanding of the bronchiectatic changes that can occur within the lung in association with or because of tuberculosis are due to the splendid and exhaustive researches of Dormer, Friedlander, and Wiles.¹⁹ These investigators have obtained excellent bronchograms on thousands of patients in all stages of tuberculosis. They proved, more than anyone else, that the procedure could be carried out with a high degree of safety and that it yielded information of great value. Their findings and conclusion are well worth summarizing here.

For example, there are troublesome cases in which a clinician finds that a patient has a positive sputum and yet the routine x-ray

fails to reveal the source of the organisms. In these cases, Dormer *et al*^{19a} have showed that bronchography may provide the answer and solve the mystery for the clinician. Collapse of the lung by pneumothorax or thoracoplasty produces benefits that are more apparent than real when judged by bronchographic studies. In not a few instances, indeed, these procedures are truly harmful. Dormer and his co-workers^{19c} have adduced considerable evidence in support of the viewpoint that whatever benefit accrues from pneumothorax in early cases of tuberculosis is the result of its effect in eliminating blockages in the bronchial system. To say that pneumothorax puts the lung to rest is physiological nonsense. Anyone who has watched a "collapsed" lung expand and contract under the fluoroscope as the patient inhales and exhales will concur with this viewpoint. If pneumothorax produces a kinking of a bronchus or in some other way converts a partial stenosis into a complete stenosis, atelectasis or an "opaque lobe" results, and, in these cases, pneumothorax is of no therapeutic value. "Artificial pneumothorax cannot get rid of such a block," state the authors,^{19c} "it accentuates it, and unless the normal relationships are quickly established by cutting of adhesions or abandoning the pneumothorax by aspirating the air the end-result is lobar bronchiectasis or lobar cavitation. This lobar collapse or black lobe is one of the worst things that can happen in a case of artificial pneumothorax."

Thoracoplasty fails just as badly when it is evaluated on the basis of bronchograms. After study of thousands of bronchograms in pulmonary tuberculosis, Dormer and his colleagues^{19f} states: "We have learned that no case is a simple proposition of cavities to be closed, but primarily a bronchiectasis with cavitation; that this curse of bronchial block dogs all cases of pulmonary tuberculosis and leaves a trail of devastation. We realized that tuberculous bronchiectasis and cavitation are pathologically similar to ordinary bronchiectasis and lung abscess. Yet, although thoracoplasty has been abandoned as a treatment for the latter forms of lung damage, it issued almost indiscriminately in tuberculosis." After thoracoplasty, the cavities may remain closed but the bronchiectasis persists in every

case. Thoracoplasty, according to the evidence presented by these researchers, is a hit-or-miss affair and the end result is not due to the skill of the operator or the prognostic ability of the physician but to the element of chance or some factors beyond our knowledge or control. In not a few cases in thoracoplasty aggravates the bronchiectasis and the ultimate result is not relief but further lung damage.

Treatment. It was quite natural for Dormer and his colleagues to attempt to find a direct intrabronchial approach by suspending various sulfonamides in the iodized oil that was instilled into the bronchi. When it was discovered that minute amounts of sulfanilamide caused no noticeable harm, larger quantities were used until the authors were suspending as much as 2 gm. of sulfonamides in each 5 cc. of iodized oil. Although the total number of cases in which this form of therapy was used is small, they found that three cases who had positive sputum for years became negative, and that a few cases of chronic lung abscess improved dramatically. By their method, they were able to concentrate as much as 3 gm. of sulfonamide powders in a few dilated bronchi—an enormous amount as compared with the quantity which would reach the bronchi after oral administration. The suspension in oil may have had the additional advantage of more prolonged action of the chemotherapeutic agent than would be obtained by instillation of the sulfonamides in an aqueous medium.

Other clinicians have also reported some degree of success with the sulfonamides in the therapy of bronchiectasis, either complicated or uncomplicated by tuberculosis. Latraverse²⁰ used a 5 per cent solution of sodium sulfathiazole by instillation into the bronchi either by way of bronchoscope or a laryngeal cannula or catheter. He found that it had practically no irritative effect on the bronchial mucosa and that it had a favorable influence on the course of the disease. In two cases in which there was partial bronchial stenosis due to engorgement of the mucous membrane, sulfathiazole instillation relieved the stenosis and caused the swelling to disappear. Norris²¹ employed sulfadiazine orally and a 5 per cent aqueous suspension of microcrystalline sulfathiazole by intratracheal or intrabronchial instillation and de-

termined that significant concentrations of the drug persisted in the bronchial secretions for as long as 48 hours. The experience of Edlin and his colleagues⁸ indicates that the sulfone, promin, may have a wider usefulness in the therapy of bronchiectasis following tuberculosis than is currently the vogue.

Interest currently centers on the antibiotics, given both intramuscularly and by inhalation. Aerosolization of penicillin and streptomycin can be performed as a preliminary to surgery, in advanced cases that are unsuitable for surgery or in early cases with the expectation of making surgery unnecessary. Postural drainage is commonly carried out prior to the inhalation of the antibiotic to clear the tracheobronchial tree as effectively as possible. In many instances the purulent secretion from the bronchi becomes thinner, less odorous and less voluminous promptly after the first few doses, the patient's temperature subsides and there is an increase in the sense of well-being. Nebulization of aerosols for the treatment of bronchiectasis has been one of the most noteworthy recent advances in the management of these cases both from the medical and surgical standpoints.

Although a detailed discussion of the treatment of bronchiectasis is not intended here, it may be well to record the experience of Olsen²² at the Mayo Clinic. Of a group of 86 patients with chronic bronchiectasis, 46 were given penicillin aerosolization in preparation for surgical resection of portions of the lung and the remaining 40 were treated in the hope of reducing the volume of pulmonary secretions. Since organisms that are insensitive to penicillin are commonly found in bronchiectasis and since organisms such as *Hemophilus influenzae* that are susceptible to streptomycin are frequently present, Olsen also added streptomycin hydrochloride to the penicillin solution in 27 of the above cases. The penicillin solutions were prepared by dissolving the sodium salt of penicillin in an isotonic solution of sodium chloride in concentrations of 10,000 units per cubic centimeter and 20 to 30 cc. were nebulized quite easily each day by the patients. Streptomycin hydrochloride was likewise dissolved in saline solution and was used in concentrations of 25 to 50 mg. per cc. It was found that 200,000 units of penicillin could be

readily combined with 0.5 to 1.0 gm. of streptomycin in 20 to 30 cc. of saline for nebulization without impairing the antibacterial activity of the penicillin and without rendering the streptomycin unstable.

A definite reduction in the volume of the pulmonary secretions was obtained in the pre-operative period of those patients treated surgically. As a matter of fact, the routine post-operative bronchoscopic examination often revealed that the bronchial tree was practically free from secretions. The 40 non-surgical cases were treated in the hospital for periods of two to eight weeks with an average of four weeks. Half of this group was given only penicillin aerosolization and the other half was given penicillin in combination with streptomycin. In 21 cases penicillin aerosolization treatment reduced the volume of the sputum to at least one-fourth of its original volume. When streptomycin was combined with penicillin a considerably greater improvement was obtained. Of the 20 patients treated with combined penicillin and streptomycin aerosols, 18 obtained a satisfactory result.

The results of aerosolization therapy for bronchiectasis at the Boston City Hospital²³ are similar to those obtained by Olsen. Of 42 treated patients, eight had subsequent surgical removal of a lobe or lobes. Penicillin aerosolization is regarded as a most effective procedure in preparing patients for operation and in preventing postoperative infections. Aerosolization appears to be superior to intramuscular injection of penicillin in these cases. In some instances there was actual improvement in the appearance of the bronchi upon subsequent bronchography. In others, the vital capacity increased 30 to 40 per cent above the levels before institution of aerosol therapy. With streptomycin aerosolization, however, it must be cautioned that drug-fastness may develop and, in these cases, even massive doses may fail to eradicate the infecting organism.

An interesting modification of aerosol therapy has recently been devised by Bryson and Grace.²⁴ Instead of using distilled water or isotonic saline as the vehicle in which one drug is suspended or dissolved, these investigators employ a bacteriostatic and bactericidal cationic detergent such as Zephiran (alkyl dimethyl benzyl ammonium chlorides in aqueous

solution). Since the cationic detergents have a pronounced "wetting action" they should have a special usefulness in thinning out viscid secretions that may be present in bronchiectasis. In practically all instances they have felt it advisable to supplement the aerosolization treatments with intramuscular injection of the antibiotic. Another procedure that has proved helpful is the administration of a bronchodilator (such as neosynephrin) by nebulization immediately prior to the use of the antibiotic solution. One hundred thousand units of penicillin are dissolved in 3 cc. of Zephiran in a 1:1000 aqueous solution; and this is nebulized every eight hours. Patient cooperation is important. The patient is carefully instructed to use forced expiration and then inhale deeply to the full limit of his vital capacity so that the maximum effect of the antibiotic-detergent solution can be obtained. Of 21 patients with bronchiectasis treated by this method, follow-up has revealed that 5 were not helped, 6 improved temporarily, and 10 were definitely benefited. It is apparent that this procedure warrants further exploration especially in combination with streptomycin. Its adaptability to the theory of tuberculosis and the complications of tuberculosis is readily appreciated by the authors who state: "Antibiotic-detergent aerosol therapy should be regarded as a supplement to the conservative management of tuberculosis, an approach that should be thoroughly explored before resorting to surgery."

The technic of bronchial lavage carries the idea behind aerosolization one step further in that a solution rather than a vapor of an antibiotic or chemotherapeutic agent is applied topically to the bronchial tree. Siltzbach²⁵ has cited several cases in which nebulized penicillin apparently failed to reach the affected bronchus but in which the successful topical administration of penicillin could be effected either through a tracheal catheter or directly to the bronchial orifice by means of a bronchoscope. Of 13 patients with chronic bronchiectasis, ten had a drop of 50 per cent or more in the volume of sputum within twenty-four hours following the penicillin instillations.

Recently, Stevenson²⁶ has described a simplified technic for bronchial lavage that is quite adaptable to home and office use. The technic

is similar to that of bronchography in which the pharynx is anesthetized and the solution is instilled through a tracheal cannula, the tip of which is held just above the epiglottis. A cleansing solution can be instilled, with or without an antibiotic added, and the patient is instructed how to position himself so that the solution runs into the desired bronchus. Treatments are given from three to five times a week at first until the procedure becomes so familiar to the patient that he can carry them out by himself as indicated at home. Such simplifications in the management of bronchiectasis should prove most helpful to both patient and physician in the therapy of this chronic disease.

LUNG ABSCESS

General Considerations. The close association that exists between bronchiectasis and lung abscess is illustrated by the fact that many investigators consider them under one heading of "suppurative diseases of the lung." In tuberculosis it may be most difficult to determine whether or not the suppuration that may follow the onslaught of the disease is caused by ectatic bronchi or small multiple lung abscesses. Clinically it may be impossible to distinguish between the two and even bronchography may not provide a definite answer. Pathologically, tuberculous cavities are abscesses but, as has already been pointed out, bronchiolar changes are frequent accompaniments of the parenchymal involvement. Since much of the medical literature that has been written about these conditions appeared before the discovery of the antibiotics and their widespread use in clinical practice, it is well to accept with some reservation the data indicating that lung abscess is an immediate surgical emergency. Perhaps the best recent evaluation of the problem is that of Mudd²⁷ who classifies the cases in three groups: (1) those that heal spontaneously, with or without antibiotics; (2) those that do not heal rapidly and leave an appreciably roentgen ray shadow at the site of the abscess and who should be treated either by external drainage or lobectomy, and (3) those in whom the abscess is chronic and thick-walled and who should preferably be treated by lobectomy.

Treatment. Multiple lung abscesses in tu-

berculosis usually contain tubercle bacilli and the management of these cases, accordingly, is that of the original disease. The prime consideration in such instances is bed rest. With bed rest alone, it is possible to obtain healing of single or multiple small tuberculous cavities, and the healing may be so complete as to leave no roentgenographic trace of the cavity. In other instances even fairly large cavities may close and leave only a fine linear density as the only evidence of its presence on the roentgenogram. Occasionally such cavities undergo apparent healing only to lead to recurrence at a later date. They should therefore be observed carefully over long periods of time.

The surgical management of tuberculous cavitation is a difficult and involved phase of the treatment of this disease and its discussion is left to specialized works on this subject. Whether thoracoplasty or resection (lobectomy or pneumonectomy) is performed depends on such factors as the size of the cavity (or cavities), the thickness of its wall, the condition of the bronchus into which it empties and the intracavity pressure in the case of giant cavities. Whereas small cavities may be benefited by therapy with streptomycin aerosolization and intramuscular streptomycin as in the case of bronchiectasis, it is generally agreed that antibiotics are of but little direct benefit when the cavities are large. In any case where there is extensive destruction of lung tissue, the defect will have to be corrected by surgical means even if the antibiotic or chemotherapeutic agent completely eradicated the tubercle bacillus. On the other hand, even though these agents are not of *direct* benefit, they do play a valuable role in preparing the patient for surgery and in minimizing postoperative complications.

EMPHYEMA

General Considerations. Just when a tuberculous pleurisy with effusion can be more properly designated as an "empyema" is still a matter of some dispute. Some writers consider an empyema to be present when the fluid aspirated from the pleural space is grossly purulent; others, when large numbers of lymphocytes or polymorphonuclear leucocytes are present even though the fluid may be only

slightly turbid grossly; and still others, when a few lymphocytes are found in the centrifuged sediment even though the aspirated specimen may be relatively clear or straw colored. This lack of uniformity in the definition of terms has made evaluation of different forms of therapy most difficult and accounts for the controversial reports that are received concerning the various types of therapy.

Empyema secondary to tuberculosis can arise in several ways. Quite commonly it makes its appearance either secondary to spontaneous pneumothorax or to artificial pneumothorax given for therapeutic reasons. This is especially true if adhesions are present between the visceral and parietal pleuras. If adhesions are stretched or are otherwise irritated, the irritation in some way may provide the formation of fluid in the pleural space. Fluid may also appear as the result of two other mechanisms associated with pneumothorax. If artificial pneumothorax is continued over many years there often is associated with it some thickening of the pleura. Later, when an attempt is made to re-expand the lung, it is found that the lung fails to respond normally to increasingly negative pressures, and fluid, infected or otherwise, may make its appearance. Similarly, if one or more lobes are atelectatic following pneumothorax, the affected lobe or lobes may fail to re-expand when an attempt is made to discontinue the pneumothorax and, as the negative pressures within the chest become higher, fluid may develop. Sudden discontinuation of pneumothorax treatments may also incite one of these mechanisms and cause fluid to appear. For this reason, whenever therapeutic pneumothorax is being abandoned, it is done as gradually as possible. Needless to say, a pleural space can become infected from without as a result of a thoracentesis or artificial pneumothorax.

Aside from its association with pneumothorax, there are other mechanisms by which infected fluid develops. Empyema may result from the rupture into the pleural space of a small subpleural caseous focus. It may be that many instances of pleurisy with effusion are due to this mechanism even when the subpleural focus may be so small as to be invisible on the roentgenogram. In other instances the pleural lining may actually be studded with

countless miliary foci that are readily demonstrable on thoracoscopic examination. In these cases fluid may be provoked and this fluid may be sterile by culture or animal inoculation tests. The finding of a "negative" fluid in such cases is not surprising if one remembers that these miliary nodules on the pleural surface may act as irritants, but unless caseation and necrosis develops they will fail to shed tubercle bacilli into the fluid around them. These cases may be contrasted with those who have readily demonstrable tuberculous lesions in the pulmonary parenchyma and in whom tuberculous empyema develops as a complication in the course of the disease.

Treatment. In view of the foregoing considerations, certain general principles of therapy or prophylaxis can be laid down. First, in regard to pneumothorax therapy it is best to discontinue a poor collapse promptly. If adhesions are found after pneumothorax has been induced, they should be cut if possible to avoid a complicating empyema. If the pneumothorax is inadequate for other reasons, such as atelectatic lobes, then empyema may be an imminent complication and an attempt should be made to re-expand the lung, either partially or completely. If the patient has extensive parenchymal disease and considerable difficulty is encountered in re-expanding the lung, it may be well to convert such a case to some other form of therapy, such as thoracoplasty. Finally, if fluid should develop under any of the above circumstances, frequent aspiration should be carried out to keep the thoracic space as "dry" as possible while every effort is made to re-expand the lung or to convert to other forms of treatment.

In the past, tuberculous empyema was always considered as a most serious complication of the disease and was associated with a high mortality. At present the situation is materially improved, largely because of a better selection of cases for pneumothorax and the reservation of those cases who might do poorly with pneumothorax for other forms of surgical treatment. Since thoracoplasty and resection have been made relatively safe, cases with large apical cavities and adherent apical pleura (who, most likely, have firm, unresectable adhesions) are not subjected to pneumothorax but often have thoracoplasty as an in-

itial collapse measure. The advances in thoracic surgery have thus reduced the incidence of tuberculous empyema. The judicious use of antibiotic and chemotherapeutic agents will probably do much to lower the morbidity and mortality of those cases in which this complication does occur.

Almost every conceivable antiseptic or anti-tuberculosis agent has been injected or poured into the pleural space with the hope of clearing up tuberculous empyema. Fairly good results have been claimed for such diverse agents as saline, merthiolate, azochloramide, gomenol, paraffin oil, neoprontosil and oxygen lavage. With the advent of penicillin, the medical treatment of empyema, particularly empyema due to pyogenic organisms, was placed on a sound and satisfactory basis.

Penicillin could be injected directly into the pleural cavity and high local concentrations could be maintained since the drug diffused only slowly into the blood stream. Of more than 250 cases of empyema due to pneumococcus, hemolytic streptococcus and staphylococcus, cited by Finland,²⁸ between one-half and two-thirds were completely cured without operative drainage by the use of aspirations and instillations of penicillin. Even in cases of putrid empyema, remarkably good results were obtained in some instances. On the basis of these extensive investigations Finland says: "Traditional indications for surgery will have to be revised in the light of these experiences. There is no doubt from a review of the literature and from our own experience that persistence in this form of treatment has resulted in remarkable cures of well established cases of empyema within three to six weeks and a follow-up of these cases has indicated that markedly thickened pleuras have resolved so that they could no longer be seen in the x-ray films. Clinically, there has been no reduction in the pulmonary function."

In the empyemas that are secondary tuberculosis, penicillin's usefulness is somewhat more limited. If the empyema is of the "mixed type," with both acid fast organisms and other penicillin-sensitive bacteria, the penicillin instillations may rid the empyema cavity of the latter but are without effect on the tubercle bacilli. It had been hoped that streptomycin would accomplish in these cases

what penicillin failed to do but, as yet, this hope has not materialized. At present, streptomycin is not recommended for the treatment of chronic empyema of tuberculous origin because of its apparent ineffectiveness in the studies thus far reported although it has been amply demonstrated that when streptomycin is injected intramuscularly more than adequate concentrations of this antibiotic can be found in the pleural cavity.²⁹ The reasons for the failure of streptomycin to be effective in these cases is not clear and further evaluation is indicated. It may be that better results will be obtained when streptomycin is combined with a chemotherapeutic agent such as promin or with a cationic detergent, used intrapleurally, as suggested by Bryson and Grace.³⁴ On the other hand, further experience may confirm the ineffectiveness of streptomycin in such cases of chronic empyema and, perhaps, some alternative form of treatment may gain wider usefulness. The recent experiments of O'Brien, Brown and Pearse³⁰ with irrigations of the pleural cavity with glycerite of hydrogen peroxide solution may then prove to be a worthwhile step in the right direction.

SUMMARY AND CONCLUSIONS

Infections of the lung, bronchi, and pleural space occur quite commonly secondary to tuberculosis, but much can be gained therapeutically if these secondary injections are differentiated from the original disease and properly treated.

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CHRISTMAS SEALS — 1948

The annual appearance of the tuberculosis seal makes us realize that another Christmas season is near. November 22nd marks the opening of the 42nd annual seal sale for tuberculosis funds in Delaware. The little Christmas seal was originated and sold for the first time in Delaware in 1907 by the late Miss Emily P. Bissell. Until her recent death Miss Bissell was president of the Delaware Anti-Tuberculosis Society. When she launched her first seal sale in 1907 many thought that her idea of selling small stamps to finance a tuberculosis program would be but a fad and fancy. A little piece of paper printed in several colors has little intrinsic value in itself, but throughout the years the seal has grown and grown as a messenger of health and today may be proud of its heritage.

Today Christmas seal funds help finance the activities of more than 3000 tuberculosis associations affiliated with the National Tuberculosis Association, and the results attained in the nation-wide fight against one of our most devastating diseases have been most gratifying. It is estimated that in the past forty years the tuberculosis death rate has been cut more than two-thirds, and that four million American lives have been prolonged or saved. It was in October, 1907, when Miss Bissell was asked to help raise three hundred dollars to keep open an open air tuberculosis shack near the Brandywine which was sheltering eighty charity patients, tended by a nurse and cook. Miss Bissell's first seal sale realized three thousand dollars.

Not only was the shack saved, but there was enough money to buy the site of the present Hope Farm, in whose modern buildings Delaware's continuing fight against tuberculosis now centers. For, although the current death rate from tuberculosis in the United States has fallen to little more than one-fifth of what it was in 1907, it still ranks first among all disease-killers of Americans between 15 and 45 years of age.

The surprising success of that experiment—ten times the sum Miss Bissell hoped to raise—

(Concluded on Page 253)



+ Editorial +

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WHAT NEXT?

Following their constitutional mandate, the great American public has gone to the polls and has elected a President who will serve for four years beginning next January, 1949. The result of this election was a total upset—nobody expected the election of Mr. Truman, and even he didn't expect to win until the staff director of the Democratic Senate Policy Committee, Mr. Leslie L. Biffle, disguised as a chicken and egg buyer, went out on the highways and byways of five midwestern states and discovered for himself that the farmer, the laborer, and the small businessman were going to vote for Mr. Truman. To the rank and file of the medical profession of this country the election comes not only as a startling surprise but, perhaps, a bitter disappointment, since Mr. Dewey was the only candidate who stated unequivocally that he was opposed to socialized medicine.

Now what? According to Mr. Arthur Krock, the famous political columnist of the

New York Times, we are going to have a labor government on a capitalistic base. Should this turn out to be true, then the United States will be following all too closely in the pattern of Great Britain, and if this pattern be followed still further, we Americans, like the Englishmen, will be faced with socialized medicine, in *two years or less*. Indeed, one of the leading planks on Mr. Truman's platform was a socialized medicine plank, and the present political powwow at Key West points to the fact that they are getting the machinery ready to put into actual legislation every plank of their platform.

What is there left to prevent the socialization of medicine in this country? Just one thing—voluntary prepayment plans, such as the Blue Cross-Blue Shield Plans and private insurance via the commercial carrier. Both of these avenues of social security have been expanding at a tremendous rate in recent years, but there seems to be a large element in the American electorate who are not content to have medical plans developed rationally, if somewhat slower, by the process of evolution; rather they want the thing done overnight, as a matter of revolution. This will not be good for America—it has not been good for any country that ever tried it.

The American medical profession between now and the next convening of Congress will have just one chance to ward off this Damoclean sword which hangs over its head. The Blue Cross Commission and the Blue Shield Commission, with Dr. Paul R. Hawley as joint executive officer, have evolved a set of Proposals for a national setup to take care of national enrollment on a national basis. There had been considerable confusion and misunderstanding, and even some fear of these Proposals until the recent Conference at French Lick, Indiana, when they were completely and satisfactorily explained and then remanded back to their sponsoring medical societies for their understanding and possible approval.

When the original drafts of these Proposals were considered by the House of Delegates of the A. M. A. at its June Session in Chicago, the House did not approve them at that time, but

advised they be given further study. It seems to us that with the conference at French Lick in mind and the recent election in mind, sufficient time has already been given to Proposals, and the time for action is now at hand. Delay may be disastrous. If the House of Delegates of the A. M. A. appreciates the serious situation in which American medicine now finds itself, it will waste no time in approving these Proposals, perhaps with amendments that will satisfy whatever diverging groups of thought that still remain. Since this is to be a labor government, according to Mr. Krock, the one consoling thought at the moment is that at the French Lick Conference Mr. Harry Becker, in charge of the Welfare Department of the C. I. O., made an address in which he stated that labor regarded the Blue Cross-Blue Shield Plans as its best buy, but that if arrangements could not be made on a national basis they would then turn to the commercial carriers, and if these could not or would not produce a satisfactory package, they would set up their own insurance organization, and added that they would have no difficulty in financing it. Hence, if Blue Cross-Blue Shield can expand rapidly enough to satisfy what will be the determining element in our next national administration, there is a possibility, perhaps a small one but still a possibility, that the enactment of the actually socializing legislation may be deferred. In other words, it is now up to the House of Delegates of the A. M. A. to approve these Blue Cross-Blue Shield Proposals promptly—or else!

V. A. SCHEDULE CHANGES

In this issue of THE JOURNAL is a revision of the fee schedule of the V. A., effective July 1, 1948, affecting radiology. Fortunately, all of these changes represent an increase in the fees allowed. To keep your files correct in this schedule business make a note that the complete original schedule was printed in the issue of March, 1948. A few reprints of this schedule are available at THE JOURNAL office.

DR. HOWARD HONORED

At the twenty-seventh annual meeting of the American Society of Clinical Pathologists, held in Chicago on October 14, Dr. John W. Howard, pathologist of the Delaware Hospital,

was elected to serve for a term of three years on the Board of Censors of the Society.

CORRECTION

In our editorial last month the Recording Secretary of the Woman's Auxiliary was given as Mrs. S. W. Rennie, whereas that office is now held by Mrs. C. Leith Munson, also of Wilmington. THE JOURNAL regrets it was misinformed.

V. A. FEE SCHEDULE

Amendments as of July 1, 1948

X-RAY THERAPY, DEEP & SUPERFICIAL

9500—Original consultation	10.00	
9501—Superficial therapy, benign lesion, per treatment, one to three fields	5.00	
9502—Superficial therapy, benign lesion, per treatment, more than three fields	10.00	
9503—Superficial therapy for skin cancer, per treatment	15.00	
9504—Maximum fee for superficial X-ray therapy for skin cancer	50.00AA	
9505—Deep X-ray therapy, per treatment	10.00	
9506—Maximum fee for deep X-ray therapy (unless greater amount is approved by the Branch Medical Director in consulta- tion with the Branch Office Section Chief	250.00	
9507—Each follow-up visit	5.00	
Radium & Radon Therapy		
9600—Original consultation	10.00	
9601—Office radium treatment	10.00	25.00AA
9602—Operative radium insertion or intra- cavity implantation	75.00	15.00AA
9603—Interstitial radon therapy, office	25.00	
9604—Interstitial radon therapy, hospital, operative	100.00	

TOTAL FEES FOR CERTAIN X-RAY PROCEDURES

	PREPARATION		X-RAY		TOTAL
	Item No.	Fee	Item No.	Fee	
Arteriography, phlebography	0270	35.00	9101	15.00	50.00
Bronchography	0271	10.00	9102	25.00	35.00
Colon, barium enema	—	—	9103	12.00	12.00
Cystography	—	—	9104	15.00	15.00
Gall bladder, Graham tech- nique	—	—	9108	20.00	20.00
Gastrointestinal, barium meal and enema	—	—	0030	35.00	35.00
Myelography	0272	15.00	9114	20.00	35.00
Pneumoencepha- lography	0273	15.00	9118	20.00	35.00
Pyelography, intra- venous	—	—	9119	20.00	20.00
Pyelography, ret- rograde	0215	35.00	9120	15.00	50.00
Small intesti- nal series	—	—	9125	20.00	20.00
Stomach and duode- num, barium meal	—	—	9131	15.00	15.00
Urethrocycto- graphy	—	—	9133	12.00	12.00
Uterosalingo- graphy	2026	15.00	9134	25.00	40.00
Ventriculo- graphy	0275	50.00	9135	20.00	70.00

CHRISTMAS SEALS—1948*(Concluded from Page 250)*

prompted the thought that a nation-wide effort during the next holiday season might be worth while. Largely through the influence of Miss Mabel T. Boardman, then its active and later honorary secretary, the National Red Cross sponsored the 1908 stamp, which was designed by Howard Pyle. To pave the way for this Miss Bissell sent out letters and news releases to 6,000 newspapers, personally advancing the cost of this publicity because she was sure the returns would far more than cover expenses. This first nation-wide sale brought in \$135,000.

Despite such a record, there still were those who doubted the lasting power of the idea. It soon would fade out as a passing fad, but those who felt otherwise pinned much of their faith to something that happened at the opening of the first Philadelphia sale—December 16th, 1907—when a really ragged newsboy reached up a penny—he was too small to see over the counter—and said, “Gimme one. Me sister’s got it!” If a street kid could get the message, surely the messenger would not fail the cause it served! It didn’t! And when, in 1910, the Red Cross asked the National Tuberculosis Association to manage the annual campaigns, mounting returns marked each succeeding seal sale. “Stamp” was dropped from the name to avoid postage confusion. In 1919 the Association became the seal’s sole sponsor, and in the next year’s design the Red Cross symbol was replaced by the double-barred adaptation of the Lorraine Cross—official international emblem of all tuberculosis organizations—now featured on each issue of this biggest little thing in the world. Ninety-five per cent of the total funds raised in Delaware each year from the seal sale remain in the state to finance the activities of the Delaware Anti-Tuberculosis Society. The other five per cent assists in the nation-wide campaign of the National Tuberculosis Association.

Readers of THE JOURNAL are familiar with the Christmas seal activities in Delaware, which have been wide and varied. First of all the Society realizes that it takes a lot of or-

ganizations and people to coordinate an effective program against tuberculosis. The Society’s relations, throughout the many years, with the official health agencies, the medical societies, the medical professions, and educational officials have been most pleasant. Christmas seal services include nursing service for the indigent in the Wilmington area in cooperation with the Wilmington Visiting Nurse Association; a cooperative program of rehabilitation in the sanatoria with the Rehabilitation Division of the State Board of Education; mass x-ray surveys in the schools, industries, and for community groups with the State Health Department and the Wilmington City Health Department; a state-wide health education program; and the maintenance of Sunnybrook Cottage. This year in April the Society opened its diagnostic chest clinic in the Buckner Building. This service now provides a long felt need in the Wilmington area. It provides x-rays for suspicious cases found in the surveys, x-rays for pre-employment foodhandlers, and x-rays for referrals from the state and city health centers, and for referrals by physicians of patients who are unable to pay for such service. The Society also provides educational and scientific literature on the subject of tuberculosis to the physicians in the state and a monthly copy of Tuberculosis Abstracts.

Dr. William Marshall, Jr., Milford, Delaware, is president of the Society. Members of the Medical Society of Delaware serving as members of the Executive Committee or the Board of Directors of the Society are: Dr. Marshall; Dr. Gerald A. Beatty, President, Wilmington Board of Health; Dr. Edwin Cameron, State Health Department; Dr. J. Leland Fox, Seaford; Dr. George H. Gehrmann, duPont Company; Dr. A. Parker Hitchens; Dr. James E. Marvel, Laurel; Dr. Joseph S. McDaniel, Dover; Dr. Laurence D. Phillips, Brandywine Sanatorium; Dr. Meredith I. Samuel; Dr. Alfred R. Shands, Jr., Nemours Foundation; Dr. M. A. Tarumianz, Delaware State Hospital; and Dr. George M. VanValkenburgh, Georgetown.

INTERIM SESSION—A.M.A.

Registrations and hotel reservations are now being accepted for the second annual Interim Meeting of the American Medical Association at St. Louis, November 30 to noon, December 3, 1948.

On the eve of the Interim Meeting, Saturday, November 27, the first national Medical Public Relations Conference will be held under sponsorship of the A. M. A. at the Statler Hotel.

Planned to be especially valuable to the general practitioner, the Interim Session will offer lecture meetings, conducted by medical leaders on conditions most often seen in daily practice. Subjects to be discussed include diabetes, heart disease, cancer, poliomyelitis, obstetrics, pediatrics, dermatology, genitro-urinary conditions, hypertension, anesthesia, tuberculosis, jaundice, laboratory diagnosis, x-ray diagnosis, and physical medicine as applied to the treatment of arthritis.

Diagnosis and treatment will be stressed in a wide variety of clinical conferences, which will be correlated with the lecture meetings. Leading practitioners from all sections of the nation will conduct these conferences.

Evening programs will feature distinguished speakers, the award of the general practitioner medal, and fun. Entertainment will be provided, free of charge to physicians and their guests of course, by stars of the amusement world.

A scientific exhibit with nearly 100 displays will show clinical and pathological material on subjects dealt with in the clinical conferences.

Approximately 115 leading firms will display technical exhibits, which will include new products, equipment, and medical publications. All exhibits will be open from Tuesday at 8:30 a. m. to Friday noon, November 30 to December 3.

Papers will be read at the General Scientific Meetings in the St. Louis Opera House from 9 to 10 a. m. and from 2 to 3 p. m. each day. At least six demonstration units are planned for each half day in the Scientific Exhibit from 10:30 a. m. to 12 noon, and from 3:30 p. m. to 5 p. m. Small rooms will be provided for these demonstrations and provision

is being made so that physicians can take all the notes they wish in comfort.

Intermissions in the program will be from 10 to 10:30 a. m., 12 noon to 2 p. m., and 5 p. m. to 6 p. m. each day.

Officers and members of the House of Delegates will stay at the Statler Hotel. Those attending the Medical Public Relations Conference will stay at the Lennox Hotel.

A registration form which enables the physician to save time by securing a registration card in advance is appearing in *The Journal of the American Medical Association* every other week until the Interim Meeting. A convenient blank for making reservations at a number of St. Louis' best hotels, which are within easy walking distance of the St. Louis Auditorium, is also printed in *The Journal*.

All reservations must be cleared through the Chairman, Subcommittee on Hotels, American Medical Association, Hotel Reservation Bureau, 1420 Syndicate Trust Building, St. Louis 1, Mo., and must be received before November 9, 1948.

DIABETES DETECTION

The discovery and treatment of diabetes mellitus at an early stage demands the attention of all practicing physicians. Failure to discover and treat diabetes early results in preventable disabilities and impairments of health. In the Diabetes Exhibit at the Annual Meeting of the American Medical Association held in Chicago in June, 1948, it was shown that the mortality rate for diabetics first seen when a complication had occurred was three times the rate for diabetics first seen earlier and before impairments had developed. Actually the future for the diabetic patient under medical treatment is brighter and more hopeful today than ever before.

In 1929, Dr. George H. Gigelow and Dr. Herbert Lombard began a study of chronic disease in Massachusetts which led to the publication of statistics showing that the number of diabetic patients in Massachusetts was far higher than had been heretofore thought. In 1935, a National Health Survey was conducted which confirmed these figures. In Oxford, Massachusetts, results of a survey by the United States Public Health Service indicates

that at least a million undiagnosed diabetics exist in the United States and Canada.

District and state medical societies now have the opportunity to take the lead in the fight against diabetes in response to an appeal to the practicing physicians of the United States, presently being made by the Committee on Diabetes Detection of the American Diabetes Association. This committee was appointed by Dr. Charles H. Best, President, at the Annual Meeting in June, 1948. Plans are being formulated for National Diabetes Week, December 6 to 12, 1948.

As a first step in a full-scale attack on diabetes, eighth among the leading causes of death, a medical society should appoint its committee on diabetes. The National Committee on Diabetes Detection stands ready to assist local committees in their work. Already the Committee is preparing material containing information on diabetes for use by the physician in his own town. These materials include programs for medical meetings, radio broadcasts and spot radio announcements for use by city and county medical societies, and suggestions for cooperation with local hospitals toward the control of diabetes.

The Committees on Post-Graduate Instruction in state and county societies should plan instructions and demonstrations in diabetes in county meetings this fall. Also, hospital staff meetings should provide a place on their program for diabetes. Committees on Public Relations and Public Information should plan meetings for instruction of laymen including patients, their families, and all others interested.

Women, too, have an important role to play in the fight to control diabetes. It is significant that diabetes is more frequent among women than among men. It is desirable to enlist the aid of women's organizations, especially the women's auxiliaries of the medical societies, as an adjunct to the program planned by medical societies.

Already a number of local diabetes associations affiliated with the American Diabetes Association have been formed. More such associations composed of physicians are needed. With the cooperation of the physicians within their area, these associations have accepted the challenge and will strive to find

and treat the million hidden diabetics. Associations will be assisted by the American Diabetes Association in attaining such objectives as: More graduate courses in diabetes for physicians; providing better laboratory services; and helping with instructions for patients. Now is the time for action—will the practicing physicians seize this opportunity for progress in an all-important field or will he prefer to surrender to others his responsibility for diabetes detection and treatment?—Committee on Diabetes Detection, Howard F. Root, Chairman, 81 Bay State Road, Boston, Massachusetts.

International Congress on Rheumatic Diseases

The first International Congress on Rheumatic Diseases ever held in the United States will take place at the Waldorf Astoria in New York City May 30 to June 3, 1949, inclusive. This seventh International Congress is sponsored by the International League Against Rheumatism. The host is the American Rheumatism Association in cooperation with the New York Rheumatism Association.

Seven (five morning and two afternoon) scientific sessions are planned. Also five one-hour round table conferences on various clinical topics will be held under the leadership of authorities in the respective fields. Short clinics, papers and reports will be given concurrently at four or five New York hospitals during three afternoons. Evening entertainment will be provided. The registration fee is \$10.00.

Instantaneous translations of the scientific papers will be made by means of the I. B. M. wireless system similar to that used at the sessions of the United Nations. The official languages of the Congress will be English, French and Spanish.

The Congress has the official sanction of the United States Department of State which will cooperate in the issuance of official invitations. This is an open meeting. Members of the International, the European, and the Pan American Leagues Against Rheumatism as well as the Canadian Rheumatism Association, British Empire Rheumatism Council, the Heberden Society of London, and the ten state or city Rheumatism Societies affiliated with the

American Rheumatism Association are especially invited.

The annual American Medical Association scientific convention will be held in Atlantic City (3-4 hours from New York) during the week following the Congress (June 6 to June 10, 1949) after which a post-convention tour has been planned.

Further information concerning the Congress will be released in the future.

The South Atlantic Association of Obstetricians and Gynecologists announces the establishment of 'The Foundation Prize.' Authors of papers on Obstetrical or Gynecological subjects desiring to compete for the prize may obtain information from Dr. E. D. Colvin, Secretary-Treasurer, 1259 Clifton Road, N. E., Atlanta, Ga.

The Eastern Section of the American Federation for Clinical Research will hold its annual meeting in Philadelphia on Saturday, December 4, 1948, at the Temple University School of Medicine.

BOOK REVIEWS

Essentials of Pathology. By Laurence W. Smith, M. D., formerly Professor of Pathology, Temple University; and Edwin S. Gault, Associate Professor of Pathology and Bacteriology, Temple University. Third Edition. Pp. 764, with 740 illustrations. Cloth. Price, \$12.00. Philadelphia: Blakiston Company, 1948.

The new 3rd edition of this text on Pathology has become a more useful reference, as well as a text, for the student. The use of 261 case reports to emphasize presentation of material continues to be an interesting experiment. Their former circumlocution has been shortened to an advantage. Whether case summaries belong in a student or reference text is questionable. This writer feels the principle is sound, but questions whether there is practical benefit.

One of the most outstanding features of the book is the number of excellent illustrations which come closer to filling the need for a teaching atlas. There are a few cuts which are below standard and should be replaced or eliminated, but by and large, each illustration presents the information desired.

No doubt one could question the presentation of specific subject material and the clarity of opinion on controversial topics. Such is

human and is why one needs several books to cover a problem.

As a general introductory pathology and a handy reference book it is to be recommended.

A. M. A. Interns' Manual. Pp. 209. Cloth. Price, \$2.25. Philadelphia: W. B. Saunders Company, 1948.

This handy little volume is the successor to "Hospital Practice for Interns" published in 1932 and "A. M. A. Interns' Manual" published in 1938. (In the present volume, the section on drugs is arranged alphabetically). The chapter headings are as follows: (1) Internships and Residencies—General Information (2) Clinical and Laboratory Data; (3) Drug Administration; (4) Materia Medica—Useful Drugs; (5) Acute Poisoning: Diagnosis and Treatment; (6) Diet and Nutrition; (7) Physical Medicine; (8) Lawful Scope of Intern Practice; (9) The American Medical Association.

As indicated by the title, the needs of the intern have been given the foremost consideration. The manual is to be used as an adjunct to any hospital rule book or hospital formulary which may be in effect in the hospital in which the intern is serving. The manual should prove even more useful to interns in hospitals which do not supply printed copies of rules, prescriptions, and procedures.

We not only recommend the book, but we recommend that the second group of hospitals make a present of it to every intern as he begins his internship.

Physician's Handbook. By John Warkentin, Ph. D., M. D., and John D. Lange, M. S., M. D. 5th edition. Pp. 293. Paper. Price, \$2.00. Palo Alto, California: University Medical Publishers, 1948.

The purpose of this Handbook has been to summarize tersely, clearly and comprehensively, diagnostic procedures and factual data, which a physician must have quickly available. At the same time the scope of this Handbook has been extended so as to be a serviceable pocket-reference for many types of medical practice. An effort has been made to include a relatively complete laboratory manual, the common clinical tests, and such other factual information as is more readily forgotten.

This is an excellent pocket companion. Recommended to medical students and interns as a welcome reminder of essential material. A practicing physician may well benefit from its refreshing pages.

